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Reply To Examiner's Remarks

Claims 1, 3, 8-9, 11, 15, 31, 38-39, 41 and 46-49, as amended herein, are presented for consideration.

The Examiner rejects all claims under 35 U.S.C. §101 as not covering statutory subject matter. The Guidelines For Subject Matter Patentability, published by the U.S.P.T.O. on 22 November 2005 in the Official Gazette, discuss consideration of "Practical Application By Physical Transformation," at page 9 of 25, noting that the claimed invention, in order to qualify as covering statutory subject matter:

"The claimed invention 'transforms' an article or physical object to a different state or thing;" or

"The claimed invention otherwise produces a useful, tangible and concrete result" based on the subsequent discussion of the factors "useful result," "tangible result," and "concrete result."

Amended claim 1 of the subject patent application recites a method of inductive learning, including the steps of providing a computer that is programmed to provide or receive training data , including at least one of archived data, simulated nominal data and off-nominal data;

to provide vectors having a set of parameters determined from the training data;

to generate a cluster database comprising clusters that are associated with respective ranges of values for at least a subset of the set of parameters;

to index the clusters of the cluster database based on an indexing distance of each of the clusters from a predetermined indexing reference point;

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to organize the clusters into a data structure of clusters based on the cluster indexing; and

to display a relationship between at least one of the vectors and the data structure in a visually perceptible format.

The computer: (i) receives the training data; (ii) provides vectors formed from sets of parameters determined from the training data; (iii) generates clusters associated with ranges of the parameters for at least a subset of the parameters; (iv) indexes the clusters based on a distance of each cluster from an indexing reference point; and (v) organizes the clusters into a data structure based on the indexing. The combination of these process steps receives training data having associated parameters, which data may be chaotic and/or unstructured, and converts or transforms these data into a data structure containing clusters that are indexed based on distance of a parameter set from an indexing reference point.

The computer also displays the data structure in a visually perceptible format. The data structure is specific (based on a specific distance function), substantial (non-trivial, through application of the distance function to provide the clusters and to identify nominal versus off-nominal behavior in the monitored system, and through indexing of the clusters), and credible (the process can be implemented using a computer, as the two examples in the subject patent application indicate). The method thus provides a "useful result" that is also "tangible" (the clusters of parameter sets and the data structure based on application of the distance function). The result is repeatable or reproducible and thus "concrete": beginning with the same training data and the same distance function, the same data structure should be reproduced. The claimed procedure, including the display of the data structure, thus produces a "useful, concrete and tangible result."

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Amended claim 1, which is implemented by a programmed computer, thus provides both a transformation of an article or physical object to a different state or thing (unorganized training data, converted to clusters and to a corresponding data structure) and “provides a useful, concrete and tangible result,” Each of the two alternative requirements for U.S.P.T.O. subject matter eligibility are thus satisfied, although satisfaction of either one of these requirements appears to suffice for subject matter eligibility according to 35 U.S.C. §101. Amended apparatus claim 31 is parallel to amended method claim 1 and is believed to satisfy the requirements of Section 101 for the same reasons that amended claim 1 satisfies the requirements of Section 101.

Amended method claim 11 recites a method for monitoring a system, the method comprising providing a computer that is programmed:

- to provide or receive a cluster database comprising clusters that are associated with respective ranges of values for at least a subset of a set of cluster parameters;

- to receive at least one monitored-system vector having monitored-system parameters, with parameter values generated by sensors that provide data measured on a monitored system ;

- to determine whether the at least one monitored-system vector is contained in any of the clusters based on at least a subset of the monitored-system parameters and the subset of the cluster parameters; and

- when at least one of the monitored-system vectors is not contained in any cluster, to determine a deviation distance of the at least one monitored-system vector from a nearest cluster, to associate the determined deviation distance with a severity of a deviation of the at least one monitored-system vector from the nearest cluster, and to display in a visually perceptible format at least one deviation

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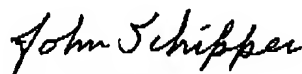
distance for the parameter values for the at least one monitored-system vector from the corresponding parameter values for the nearest cluster.

By analogy with the analysis of amended claim 1, the procedural steps recited in amended claim 11, performed by the programmed computer: (1) transform or convert an article or physical object (unstructured ranges of parameter values associated with an object) into a different state or thing (clusters of the objects in which a distance of an object from a nearest cluster is no greater than a selected deviation); and (2) provide a useful, concrete and tangible result (visually perceptible display of the respective ranges of parameter value sets associated with one or more of the clusters). The Applicant believes that amended method claim 11, and the corresponding amended claim 41, also satisfy the subject matter eligibility requirements set forth in the OG Notice, 22 November 2005.

After the transformation, the data within a given cluster are related to each other, through relationships of the parameters and/or adjacent or overlapping ranges of the parameter values. These parameter values represent an operating state of the system that provided the data. In effect, the programmed computer creates order where the data were originally chaotic and unstructured.

The Applicant requests that the Examiner withdraw the Section 101 rejection of the claims 1, 3, 8-9, 11, 15, 31, 38-39, 41 and 46-49, as amended herein, and proceed with further examination of the application on its merits.

Respectfully Submitted,



John Schipper

Patent representative for Applicant

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